

U.S. Application Serial No. 09/330,215

Attorney Docket No. 108907-09014

positions are not well taken.

It is noted that Maccarone (see the paragraph bridging pages 1417-1418) teaches that the effective transfection of naked plant cells has been achieved by using negatively charged liposomes. Also in the last lines of the abstract of the Litzinger reference, it is stated that the results reported in the Litzinger paper are relevant to the design of cationic liposomes for efficient delivery of nucleic acid in vivo.

It is also observed that in the first paragraph of the chapter entitled "Introduction," on page 32 of the Zelphati reference, states that antisense oligonucleotides (ODN), before reaching their intracellular target, must overcome several obstacles. These obstacles include the sensitivity of the ODN's to nucleases, the poor cellular uptake of ODN's and the capacity of ODN's to hybridize to the target DNA or RNA present in the cytoplasm and/or in the nucleus of a cell.

In the third paragraph of the same chapter, it is stated that ODN's which have complexed to cationic liposomes have been successfully used in various biological models that demonstrate the potential of cationic lipids to deliver ODN to multiple cell types.

Eastmann (see the first lines of the left column of page 766) states that cationic lipids have been intensely studied as potential clinical gene therapy vehicles.

Eastmann in the paragraph "Discussion," right column of page 771, further states the following (quote):

"Successful aerosol delivery of cationic lipid:pDNA complexes places rather stringent requirements on the formulation. Because of the relative inefficiency of cationic

U.S. Application Serial No. 09/330,215

Attorney Docket No. 108907-09014

lipids as gene delivery vehicles, relatively large amounts of material need to be delivered  
(emphasis added)."

Therefore, the cited references not only state that cationic liposomes are required in order to achieve effective transfection, but also that, as seen in Eastmann, these vectors require large amounts of material for effective delivery.

It is therefore submitted that the references cited by the Examiner are not relevant to the present invention because these references state that complexation is required for oligonucleotides to achieve effective pharmacological activity (i.e. transfection ability).

Additionally, the cited references teach that this delivery method is inefficient and that, therefore, large amounts of materials are needed. Thus, it is submitted that the cited references teach away from the solution claimed in the present application. This is supported by the fact that the claimed polydeoxyribonucleotides obtained by depolymerization of nucleic acids are effective drugs even without complexation (see page 4 of the present specification). Further, the claimed liposome complexes of the polydeoxyribonucleotides obtained by depolymerization of nucleic acids greatly reduce the quantity of the used polydeoxyribonucleotide and, at the same time, permit a higher effectiveness than those of the cited references, as demonstrated by Gursoy.

Therefore, it is submitted that the cited references are not relevant to the present invention.

Additionally, Applicant would like to remind the Examiner that the problem solved by the present invention was not the increasing of the drug efficacy of the instant

U.S. Application Serial No. 09/330,215

Attorney Docket No. 108907-09014

oligonucleotides by cationic liposome complexation. Rather, the problem solved by the present invention was how to find complexes of liposomes with polydeoxyribonucleotides, obtained by depolymerization of nucleic acids, that show an improved stability over the already known liposomes complexes of the same drugs.

It is submitted that there are no teachings in the references cited by the Examiner that could direct the skilled to the solution found in the present invention. Therefore, it is requested that all of the bases for rejecting the claims be withdrawn and that a Notice of Allowance be issued.

In the event this paper is not timely filed, applicants hereby petition for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300, along with any other additional fees which may be required with respect to this paper referencing Attorney Docket No. 108907-09014.

Respectfully submitted,



D. Daniel Dzara, II  
Registration No. 47,543

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC  
1050 Connecticut Avenue, N.W., Suite 400  
Washington, D.C. 20036-5339  
Tel: (202) 857-6000  
Fax: (202) 638-4810  
DDD/mzk

Enclosure: Petition for Extension of Time (two months)

TECH/163142.1